08CN8803-26

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Thomas P. Feist, et al.	Group Art Unit: 1773
Serial No.:	10/063,004	
Filed:	March 11, 2002	Examiner: K. Bernatz
For:	POLY(ARYLENE ETHER) DATA STORAGE MEDIA	

Mail Stop: Appeal Brief - Patents
Commissioner for Patents
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APPEAL BRIEF

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is General Electric Company.

II. RELATED APPEALS AND INTERFERENCES

There are three other appeals known to Appellant that may directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal; namely the appeals of U.S. Patent Application No. 09/683,114 to Davis et al. and U.S. Patent Application Nos. 09/845,743 and 09/846,889 to Feist et al. There are no interferences known to Appellant, Appellant's legal representatives, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF THE CLAIMS

Claims 1 – 41 are pending in the application. All of the pending claims stand rejected. The rejection of Claims 1 – 41 is appealed. Claims 1 – 41, as they currently stand, are set forth in Appendix A.

IV. STATUS OF AMENDMENTS

All amendments have been entered.

V. SUMMARY OF THE INVENTION

This application relates to storage media and methods for retrieving data. Optical, magnetic, and magneto-optic media are primary sources of high performance storage technology that enables high storage capacity coupled with a reasonable price per megabyte of storage. Improved areal density has been one of the key factors in the price reduction per megabyte, and further increases in areal density continue to be demanded by the industry. (Paragraph [0004])

Polymeric data storage media have only been employed in areas such as compact disks (CD), and similar relatively low areal density devices, e.g., less than about 1 Gbit/in^2, which are read-through devices requiring the employment of a good optical quality substrate having low birefringence. (Paragraph [0006])

Storage media of higher areal densities, e.g., greater than 5 Gbits/in^2, employ first surface or near field read/write techniques in order to increase the areal density. For such storage media, although the optical quality of the substrate is not relevant, the physical and mechanical properties of the substrate become increasingly important. For high areal density applications, including first surface applications, the surface quality of the storage media can affect the accuracy of the reading device, the ability to store data, and replication qualities of the substrate. Furthermore, the physical characteristics of the storage media when in use can also affect the ability to store and retrieve data; i.e., the axial displacement of the media, if too great, can inhibit accurate retrieval of data and/or damage the read/write device. (Paragraph [0008])

Conventionally, storage media associated with employing first surface, including near field techniques have been addressed by utilizing metal (e.g., aluminum) and glass substrates. These substrates are formed into a disk and the desired layers are disposed upon the substrate using various techniques, such as sputtering. (Paragraph [0009]) As is evident from the fast pace of the industry, the demand for greater storage capacities at lower prices, the desire to have re-writable disks, and the numerous techniques being investigated, further advances in the technology are constantly desired and sought. (Paragraph [0010])

As is clearly evident in many homes within the United States, technology surrounding data storage has changed drastically in the past 30 years. Whereas 30 years ago many Americans were not familiar with a computer, how it works, or its potential uses, computers are prevalent in American homes today. Main frames are no longer prominent, personal computers have replaced these "archaic" devices. Even preschoolers use computers for learning and play games. The video industry has similarly changed drastically from the old reel film (on which many people still have "old movies", to video cassettes, and more recently to DVDs). Cassette tapes are being replaced with compact discs. Basically, the data storage industry is screaming forward at an

incredible rate.

To address the industry needs, Appellants have developed a data storage media that is particularly useful in first surface type applications. The claimed storage medias comprise: (i) a substrate comprising a single phase plastic resin portion, wherein the plastic resin portion comprises poly(arylene ether) and a styrene material selected from the group consisting of polystyrene, styrenic copolymer(s), and reaction products and combinations comprising at least one of the foregoing styrene material(s) (Claims 1 – 21, 38, and 39); (ii) a substrate comprising a single phase plastic resin portion, wherein the plastic resin portion consists essentially of poly(arylene ether) and a styrene material selected from the group consisting of polystyrene, styrenic copolymer(s), and reaction products and combinations comprising at least one of the foregoing styrene material(s) (Claims 22 - 29); or (iii) a substrate having a thickness of about 0.8 mm to about 2.0 mm and comprising a single phase plastic resin portion, wherein the plastic resin portion comprises poly(arylene ether) and polystyrene. The claimed method comprises: (i) rotating a storage media having a substrate comprising a single phase plastic resin portion and a data layer disposed on a surface of the substrate, wherein the plastic resin portion comprises poly(arylene ether) and a styrene material selected from the group consisting of polystyrene, styrenic copolymer(s), and reaction products and combinations comprising at least one of the foregoing styrene material(s) (Claims 30 – 37 and 75). The claimed optical disk comprises a substrate comprising a single phase plastic resin portion, wherein the plastic resin portion comprises poly(arylene ether) and a styrene material selected from the group consisting of polystyrene, styrenic copolymer(s), and reaction products and combinations comprising at least one of the foregoing styrene material(s) (Claim 40).

VI. ISSUES

1. WHETHER CLAIMS 1 – 15 AND 18 – 41 ARE OBVIOUS OVER U.S. PATENT NO. 5,130,356 TO FEUERHERD ET AL. IN VIEW OF U.S. PATENT NO. 5,972,461 TO SANDSTROM?

2. WHETHER CLAIMS 16 AND 17 ARE OBVIOUS OVER FEUERHERD ET AL. IN VIEW OF SANDSTROM AND FURTHER IN VIEW OF U.S. PATENT NO. 5,538,774 TO LANDIN ET AL.?

VII. GROUPING OF CLAIMS

The claims do not stand together. The claims are directed to various novel storage media and methods. Claims 38 and 39 claim specific, non-obvious, radial tilt parameters of the storage media.

VIII. ARGUMENT

1. CLAIMS 1 – 15 AND 18 – 41 ARE NON-OBVIOUS OVER FEUERHERD ET AL. IN VIEW OF SANDSTROM.

Feuerherd et al. teach an optically transparent, isotropic molding, for optical purposes that is free of orientation birefringence. The molding can be used for an audio compact disk (CD), audiovisual compact disk (CDV), laser-optical computer disk and magneto-optical computer disk. (Abstract) In other words, they focus on birefringence, transparency, and materials that will produce an optical, read-through disk that will have extended life and avoid the problems of conventional read-through disks. "[I]n this method of recording,… the recording layer is usually irradiated through the dimensionally stable substrate…" (Col. 20, lines 10 – 18)

Sandstrom discloses a "Rewritable Optical Data Storage Disk Having Enhanced Flatness". In order to attain the "enhanced flatness" and avoid process induced surface variations such as warpage and tilt, Sandstrom disclosed a substrate with increased thickness that is greater than or equal to approximately 1.5 mm and less than or equal to approximately 2.5 mm. (Abstract and throughout the Specification) As is noted by the Examiner, Sandstrom notes the existence of different types of storage media; e.g., substrate-incident recording (beam passes through the substrate before it reaches the recording layer) and near-field, air-incident recording (beam does not pass through the substrate). (Col. 1, lines 17 – 25)

Sandstrom has been relied upon to allegedly teach that "air-incident recording is preferred because it 'has the potential to produce extremely small spot sizes..., thereby providing increased spatial density and data storage capacity'" (Final Rejection dated March 4, 2004 (hereinafter "FR"), page 3) Based upon this language in Sandstrom, the Examiner contends that "it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify the device of Feuerherd et al. to utilize air-incident recording meeting applicants' claim[s]..." *Id.*

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine,* 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson,* 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996). Therefore, even assuming that all elements of an invention are disclosed in the prior art, an Examiner cannot establish obviousness by locating references that describe various aspects of a patent applicant's invention without also providing evidence of the motivating force which would have impelled one skilled in the art, with an expectation of success, to do what the patent applicant has done. The references, when viewed by themselves and not in retrospect, must suggest the invention. *In Re Skoll*, 187 U.S.P.Q. 481 (C.C.P.A. 1975).

Appellants do not deny the existence of different types of storage media. However, these different types of media have different requirements, specifications, and capabilities. The various media are not interchangeable. For example, a DVD will not play in a CD player, and a magneto-optic disk will not play in a DVD player or a CD player. The different media have different characteristics, are formed differently, written to differently, and read differently. Expectations for one type of media are not the same as another type of media. This is actually

supported by the very reference that the Examiner relies upon to teach that media are "interchangeable".

Sandstrom teaches that an "air gap forms a bearing over which the flying head rides during operation. For near-field recording, the thickness of the air gap is less than one wavelength of the recording beam." (Col. 1, lines 32 – 37) In order to operate in these types of conditions (i.e., near field; not reading through the substrate), enhanced flatness is necessary.

> [c]onventional spatial densities of optical disks ordinarily tolerate some degree of focusing error, and therefore are not greatly impacted by flatness variation. Also, to the extent that focusing error is a problem, conventional substrate-incident recording drives typically include closed-loop focus adjustment across the surface of the disk. *At higher spatial densities, however, surface deviation can impair the ability of the drive laser to consistently write and read to and from individual domains on the disk.... Higher spatial densities may allow very little if any tolerance for focusing error induced by flatness variation.*

(Sandstrom, Col. 3, lines 43 – 59; *emphasis* added)

> The increased thickness of [Sandstrom's] substrate enhances the flatness of the recording disk relative to a recording plane... The *enhanced flatness enables* data to be recorded on the disk in a consistent manner with greater spatial densities using techniques such as near-field, air-incident recording.

(Sandstrom, Col. 2, lines 27 – 32; *emphasis* added) In other words, Sandstrom teaches that all disks are **not** created equal; disk types are not interchangeable. In order to operate in a near field, air-incident environment, additional issues must be addressed such as deviations from the recording plane. Sandstrom addressed this issue.

Appellants specifically claim a media where the data layer can be at least partly read from, written to, or a combination thereof by an energy field such that the energy field is incident upon the data layer before it could be incident upon the substrate. In other words, Appellants are claiming a particular type of media. Since one of ordinary skill in the art readily understands that various media are not interchangeable, that standard CDs do not possess the necessary characteristics to be used for air-incident type applications, for example, and that Sandstrom

teaches that the media are not interchangeable, an artisan would not have been motivated to use the teachings of Freuerherd et al. in the preparation of a media as is taught and claimed in the present application.

The test for obviousness is not what an artisan could or might do, but what they *would* have been *motivated* to do at the time of the present invention *with an expectation of success.* Considering that artisans clearly understand the differences between the various types of storage media, and considering that Sandstrom supports that understanding, an artisan would not have been motivated to use the teachings of Freuerherd et al. with any type of media except the media taught by Freuerherd et al.:

> This novel molding for optical purposes should be particularly suitable as a dimensionally stable substrate for audio compact disks (CD), for audiovisual compact disks (CDV), for laser-optical computer disks and for magneto-optical computer disks.

(Col. 3, lines 13 – 18) Freuerherd et al. in no way suggest or provide any motivation that their "novel molding" can be used for anything other than substrate-incident media.

In response to Appellants position that Sandstrom teaches that media are not interchangeable, the Examiner contends that

> Sandstrom explicitly mentions that the disclosed disk "preferably is constructed for air-incident recording", but also mentions that the disk "could be adapted for substrate-incident recording, however, by selecting the ordering in which the various layers are deposited" (col. 8, lines 59 – 63), thereby teaching the case of interchanging from air-incident media to substrate-incident media.... As such, the Examiner deems that there is clear teaching in the relied upon references that substrates used in CD production can be used for both air-incident or substrate-incident recording.

(FR, page 9)

Although Sandstrom states that *their* disk "could be adapted for substrate-incident recording", they do not state that "substrates used in CD production can be used for both air-incident or substrate-incident recording" as stated by the Examiner. In applying Section 103, the U.S. Court of Appeals for the Federal Circuit has consistently held that one must consider both

the invention and the prior art "as a whole". See, Interconnect Planning Corp. v. Feil, 227 U.S.P.Q. 543, 551 (Fed. Cir. 1985) and cases cited therein.

> Not only must the claimed invention as a whole be evaluated, but so also must the references as a whole, so that their teachings are applied in the context of their significance to a technician at the time - a technician without our knowledge of the solution.

Id. In other words, the Examiner must read Sandstrom as a whole for what Sandstrom teaches and not pick words and phrases out of context and apply specific statements generally without motivation in Sandstrom. Sandstrom teaches that disks are not created equal and are *not* interchangeable. In order to operate in a near field, air-incident environment, additional issues must be addressed such as deviations from the recording plane. Additionally, a teaching that *Sandstrom's specific disk* can be used in a substrate-incident recording in no way suggests that all media that is useful in a substrate-incident recording can be used in an air-incident recording. There is no motivation for such a presumption or any expectation of success.

Regarding Claims 31 and 32, the Examiner contends that

> Sandstrom teach[es] that for air-incident recording it is know to utilize a reflecting layer between the substrate… and the data layer, which prevents the energy field from being incident on the *data layer*…

(FR, page 6; *emphasis* added) It is assumed that the Examiner intended to say "incident on the substrate" and not "incident on the data layer".

Regarding Claims 38 and 39, although Sandstrom discusses flatness, warpage, and tilt, and the need for these features in air-incident recording, that is not a teaching as to a specific flatness, warpage, and tilt in a media having a plastic resin portion comprising poly(arylene ether) and a styrene material. As discussed above, these properties are not result effective variables and are not attainable by routine experimentation.

It is noted that "consisting essentially of" is discussed in the Final Rejection. (FR, pages 3 – 5). As evidence that elements do not effect the capability of the substrate for use in near-field air-incident recording at high recording density, the Examiner cites various claims. Appellants note that the claim that uses "consists essentially of" is Claim 22 and the dependent claims therefrom, namely Claims 23 – 29. The "consists essentially of" is set forth in the body of the claim, in relation to the plastic resin portion that is claimed to be "a single phase".

22. A storage media for data, the media **comprising**:
a substrate comprising *a single phase plastic resin portion, wherein the plastic resin portion **consists essentially of*** poly(arylene ether) and a styrene material selected from the group consisting of polystyrene, styrenic copolymer(s), and reaction products and combinations comprising at least one of the foregoing styrene material(s); and
a data layer on the substrate;
wherein the data layer can be at least partly read from, written to, or a combination thereof by an energy field; and
wherein, when the energy field contacts the storage media, the energy field is incident upon the data layer before it could be incident upon the substrate.

(*emphasis* added) As can be seen from Claim 20, "comprising" language is used in the preamble to describe the storage media, and "consisting essentially of" language is used in the body to modify "a single phase plastic resin portion". Hence, it is the features of the plastic resin portion, namely that they are a single phase, that is relevant; i.e., that is addressed by the language "consisting essentially of". It is not relevant whether the elements of the claims depending from Claim 1 do or do not "effect the capability of the substrate for use in near-field air-incident recording...". Again, the "consisting essentially of" language is employed in relation to the materials of the "single phase plastic resin portion". Therefore, the issue is whether the element would affect the plastic resin portion's ability to be a single phase.

The Examiner disagrees, quoting MPEP §2111.03 and asserts that "the basic and novel characteristics of Appellants' invention is 'a substrate capable of being used of near-field incident recording at a high recording density'". (FR, page 9) Appellants do not deny that consisting essentially of language restricts the element to materials that do not effect the basic

and novel characteristics of the element. What Appellants disagree with is that the "consisting essentially of" language is modifying the storage media.

With respect to tilt, the Examiner contends that it is a "result effective variable". (FR, page 7). In order for a variable to be "result effective":

> [a] particular parameter must first be recognized as a result-effective variable, i.e., a variable that achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977)

(MPEP 2144.05 (II.B)) In other words, the variable must achieve a recognized result *and* must be attainable by routine experimentation. The mere recognition of a desired property or characteristic, e.g., flatness, tilt, and the like, does not render that property attainable by "routine experimentation" or "mere optimization".

Sandstrom discusses flatness by discussing flatness problems with the prior art and by teaching that reduced warp can be attained with a thick disk (i.e., thickness ≥1.5 mm). Sandstrom claims this disk. Clearly Sandstrom does not consider, and does not teach, that flatness is a "result effective variable"; Sandstrom considers it a novel feature of their disk. Although new media are constantly being developed, and various attempts at improving the properties have been made, the improvements are not simple, obvious, or mere "cause effective variables". Sandstrom addressed warp by increasing thickness. The Examiner contends, however, that

> it would have been obvious to one of ordinary skill in the art to have minimized the results effective variable such as the radial tilt through routine experimentation, especially given the teaching in Sandstrom regarding the desire to minimize the tilt and maximize the flatness of the disk to achieve high recording density...

(FR, page 7) The Examiner provides no explanation, or basis in technical reasoning or fact to explain why a *desired* radial tilt and/or flatness can be attained with routine experimentation. The reference relied upon, Sandstrom, attains their *desired* flatness, by making a thicker media.

Sandstrom in no way suggests that mere optimization or routine experimentation can be employed to achieve a desired flatness, warp, or radial tilt. A "desire" to minimize tilt and maximize flatness is not a teaching that a variable is result effective or that the variable can be attained through routine experimentation, and does not relieve the Examiner of his duty to establish a *prima facie* case of obviousness. The mere desire of Sandstrom does not support a *prima facie* case of obviousness. A *prima facie* case of obviousness has not been established.

For at least the above reasons, Freuerherd et al., in view of Sandstrom, fail to render the present claims obvious. Reversal of this rejection is respectfully requested.

2. CLAIMS 16 AND 17 ARE NON-OBVIOUS OVER FEUERHERD ET AL. IN VIEW OF SANDSTROM AND FURTHER IN VIEW OF LANDIN ET AL.

Landin et al. is directed to a method for internally damping a rotatable storage article, which is subject to resonant vibration (Abstract). Landin et al. do not, however, rectify the problems associated with Freuerherd et al. and Sandstrom as discussed above. Landin et al. do not provide the motivation or expectation of success to combine Freuerherd et al. and Sandstrom or to use Freuerherd et al. as suggested by the Examiner. Without the necessary motivation and expectation of success, no prima facie case of obviousness has been established. As discussed above, the independent claims are non-obvious. As dependent claims from the allowable independent claims, Claims 16 and 17 are also allowable. Freuerherd et al., alone and in view of Sandstrom and Landin et al., fail to render the present claims obvious. Reversal of this rejection is respectfully requested.

IX. CONCLUSION:

In summary, all of the claims of the present application are non-obvious in view of the art of record, alone or in combination. There is no teaching, motivation, or expectation of success to combine the references as suggested in the Final Rejection. No *prima facie* case has been established. The element of tilt is not attainable by mere optimization. Finally, "consisting

essentially of" modifies the single phase plastic resin portion, and not the preamble of the claims.

Considering that the claimed media are non-obvious, and that the properties are not "necessarily present" or "cause effective variables", the Examiner has failed to establish a *prima facie* case of obviousness. In view of the foregoing, it is urged that the Final Rejection of Claims 1 – 41 be overturned and the claims allowed. The Final Rejection is in error and should be reversed.

If there are any additional charges with respect to this Appeal Brief, please charge them to Deposit Account No. 07-0862.

Respectfully submitted,

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APPENDIX A

CLAIMS

IN THE CLAIMS:

1. (Previously Presented) A storage media for data, comprising:

a substrate comprising a single phase plastic resin portion, wherein the plastic resin portion comprises poly(arylene ether) and a styrene material selected from the group consisting of polystyrene, styrenic copolymer(s), and reaction products and combinations comprising at least one of the foregoing styrene material(s); and

a data layer on the substrate;

wherein the data layer can be at least partly read from, written to, or a combination thereof by an energy field; and

wherein, when the energy field contacts the storage media that has a thickness of about 0.8 mm to about 2.5 mm, the energy field is incident upon the data layer before it could be incident upon the substrate.

2. (Original) The storage media as in Claim 1, further comprising surface features selected from the group consisting of servo-patterning, edge features, asperities, and combinations comprising at least one of the foregoing surface features.

3. (Original) The storage media of Claim 1, wherein the poly(arylene ether) has a weight average molecular weight of about 5,000 to about 50,000 AMU, and the polystyrene has a weight average molecular weight of about 10,000 to about 300,000 AMU.

4. (Original) The storage media of Claim 3, wherein less than or equal to about 20 wt% of the poly(arylene ether) has a weight average molecular weight of less than or equal to about 15,000 AMU.

5. (Original) The storage media of Claim 4, wherein less than or equal to about 10 wt% of the poly(arylene ether) has a weight average molecular weight of less than or equal to about 15,000 AMU.

6. (Original) The storage media of Claim 5, wherein less than or equal to about 5 wt% of the poly(arylene ether) has a weight average molecular weight of less than or equal to about 15,000 AMU.

7. (Original) The storage media of Claim 1, wherein the plastic resin portion further comprises less than or equal to about 90 wt% poly(arylene ether) and less than or equal to about 90 wt% styrene material, based on the total weight of the plastic resin portion.

8. (Original) The storage media of Claim 7, wherein the plastic resin portion further comprises about 25 wt% to about 75 wt% poly(arylene ether) and about 25 wt% to about 75 wt% styrene material, based on the total weight of the plastic resin portion.

9. (Original) The storage media of Claim 8, wherein the plastic resin portion further comprises about 40 wt% to about 60 wt% poly(arylene ether) and about 40 wt% to about 60 wt% styrene material, based on the total weight of the plastic resin portion.

10. (Previously Presented) The storage media of Claim 1, wherein the styrene material comprises the styrenic copolymer, and wherein the styrenic copolymer is prepared by bulk, suspension or emulsion polymerization using a monovinyl aromatic hydrocarbon selected from the group consisting of alkyl-, cycloalkyl-, aryl-, alkylaryl-, aralkyl-, alkoxy-, aryloxy-, and reaction products and combinations comprising at least one of the foregoing monovinyl aromatic hydrocarbon.

11. (Original) The storage media as in Claim 10, wherein the hydrocarbon is selected from the group consisting of styrene, 4-methylstyrene, 3,5-diethylstyrene, 4-n-propylstyrene, a-methylstyrene, a-methylvinyltoluene, a-chlorostyrene, a-bromostyrene, dichlorostyrene, dibromostyrene, tetrachlorostyrene, and combinations comprising at least one of the foregoing hydrocarbons.

12. (Previously Presented) The storage media of Claim 1, wherein the styrene material comprises the styrenic copolymer, and wherein the styrenic copolymer has less than or equal to about 25 mole% co-monomer.

13. (Original) The storage media of Claim 12, wherein the styrenic copolymer has about 4 mole% to about 15 mole% co-monomer.

14. (Original) The storage media of Claim 13, wherein the styrenic copolymer has about 6 mole% to about 10 mole% co-monomer.

15. (Original) The storage media of Claim 12, wherein the co-monomer is selected from the group consisting of acrylonitrile, maleic anhydride, and reaction products and combinations comprising at least one of the foregoing co-monomers.

16. (Original) The storage media of Claim 1, further comprising an additive selected from the group consisting of silicates, titanium dioxide, glass, zinc oxide, zinc sulfide, carbon black, graphite, calcium carbonate, talc, mica, and reaction products and combinations comprising at least one of the foregoing additives.

17. (Original) The storage media of Claim 16, wherein the additives are in a form selected from the group consisting of continuous fibers, chopped fibers, flakes, nanotubes, spheres, particles, and combinations comprising at least one of the foregoing forms.

18. (Original) The storage media of Claim 1, further comprising an additive selected from the group consisting of mold release agent(s), UV absorber(s), light stabilizer(s), thermal

stabilizer(s), lubricant(s), plasticizer(s), dye(s), colorant(s), anti-static agent(s), anti-drip agent(s), and reaction products and combinations comprising at least one of the foregoing additives.

19. (Previously Presented) The storage media of Claim 1, wherein the styrene material comprises about 25 wt% to about 90 wt% polystyrene and about 10 wt% to about 75 wt% styrenic copolymers, based upon the total weight of the styrene material.

20. (Previously Presented) The storage media of Claim 19, wherein the styrene material further comprises about 50 wt% to about 90 wt% polystyrene and about 10 wt% to about 50 wt% styrenic copolymers, based upon the total weight of the styrenic material.

21. (Original) The storage media of Claim 1, wherein the poly(arylene ether) has an intrinsic viscosity of about 0.10 to about 0.60 dl/g measured in chloroform at 25°C.

22. (Previously Presented) A storage media for data, the media comprising:

a substrate comprising a single phase plastic resin portion, wherein the plastic resin portion consists essentially of poly(arylene ether) and a styrene material selected from the group consisting of polystyrene, styrenic copolymer(s), and reaction products and combinations comprising at least one of the foregoing styrene material(s); and

a data layer on the substrate;

wherein the data layer can be at least partly read from, written to, or a combination thereof by an energy field; and

wherein, when the energy field contacts the storage media, the energy field is incident upon the data layer before it could be incident upon the substrate.

23. (Original) The storage media of Claim 22, wherein less than or equal to about 20 wt% of the poly(arylene ether) has a weight average molecular weight of less than or equal to about 15,000 AMU.

24. (Original) The storage media of Claim 23, wherein less than or equal to about 10 wt% of the poly(arylene ether) has a weight average molecular weight of less than or equal to about 15,000 AMU.

25. (Original) The storage media of Claim 24, wherein less than or equal to about 5 wt% of the poly(arylene ether) has a weight average molecular weight of less than or equal to about 15,000 AMU.

26. (Previously Presented) The storage media of Claim 22, wherein the styrene material comprises the styrene copolymer, and wherein the styrenic copolymer has less than or equal to about 25 mole% co-monomer.

27. (Original) The storage media of Claim 26, wherein the styrenic copolymer has about 4 mole% to about 15 mole% co-monomer.

28. (Original) The storage media of Claim 27, wherein the styrenic copolymer has about 6 mole% to about 10 mole% co-monomer.

29. (Original) The storage media of Claim 22, wherein the poly(arylene ether) has an intrinsic viscosity of about 0.10 to about 0.60 dl/g measured in chloroform at 25°C.

30. (Previously Presented) A method for retrieving data, comprising:

rotating a storage media having a substrate comprising a single phase plastic resin portion and a data layer disposed on a surface of the substrate, wherein the plastic resin portion comprises poly(arylene ether) and a styrene material selected from the group consisting of polystyrene, styrenic copolymer(s), and reaction products and combinations comprising at least one of the foregoing styrene material(s);

directing an energy field at the storage media such that the energy field is incident upon the data layer before it can be incident upon the substrate; and

retrieving information from the data layer via the energy field.

31. (Original) The method for retrieving data as in Claim 30, further comprising passing at least a portion of the energy field to the data layer, and passing at least a part of the portion of the energy field back from the data layer.

32. (Original) The method for retrieving data as in Claim 30, wherein the energy field is incident upon the data storage layer without being incident upon the substrate.

33. (Original) The method for retrieving data as in Claim 30, wherein less than or equal to about 10 wt% of the poly(arylene ether) has a weight average molecular weight of less than or equal to about 15,000 AMU.

34. (Original) The method for retrieving data as in Claim 33, wherein less than or equal to about 5 wt% of the poly(arylene ether) has a weight average molecular weight of less than or equal to about 15,000 AMU.

35. (Previously Presented) The method for retrieving data as in Claim 30, wherein the styrene material comprises the styrenic copolymer, and wherein the styrenic copolymer has about 4 mole% to about 15 mole% co-monomer.

36. (Original) The method for retrieving data as in Claim 35, wherein the styrenic copolymer has about 6 mole% to about 10 mole% co-monomer.

37. (Original) The method for retrieving data as in Claim 30, wherein the poly(arylene ether) has an intrinsic viscosity of about 0.10 to about 0.60 dl/g measured in chloroform at 25°C.

38. (Previously Presented) The storage media of Claim 1, further comprising a maximum radial tilt of less than about 1°, measured in a resting state.

39. (Previously Presented) The storage media of Claim 38, wherein the radial tilt is less than about 0.3°, measured in a resting state.

40. (Previously Presented) An optical disk, comprising:

a substrate comprising a single phase plastic resin portion, wherein the plastic resin portion comprises poly(arylene ether) and a styrene material selected from the group consisting of polystyrene, styrenic copolymer(s), and reaction products and combinations comprising at least one of the foregoing styrene material(s); and

a data layer on the substrate;

wherein the data layer can be at least partly read from, written to, or a combination thereof by a light; and

wherein, when the light contacts the storage media, the light is incident upon the data layer before it could be incident upon the substrate.

41. (Previously Presented) A storage media for data, comprising:

a substrate having a thickness of about 0.8 mm to about 2.0 mm and comprising a single phase plastic resin portion, wherein the plastic resin portion comprises poly(arylene ether) and polystyrene; and

a data layer on the substrate;

wherein the data layer can be at least partly read from, written to, or a combination thereof by an energy field; and

wherein, when the energy field contacts the storage media, the energy field is incident upon the data layer before it could be incident upon the substrate.